

CLAIMS

What we claim is:

1. (amended) An epoxy resin composition comprising an epoxy resin (A), a phenolic resin (B), an inorganic filler (C) and a curing accelerator (D), wherein said composition does not comprise any flame retardant materials or flame retardant auxiliaries: a flexural modulus E (kgf/mm²) at 240 ± 20°C of a cured article obtained by curing the composition is a value satisfying $0.015W + 4.1 \leq E \leq 0.27W + 21.8$ in the case of $30 \leq W < 60$, or a value satisfying $0.30W - 13 \leq E \leq 3.7W - 184$ in the case of $60 \leq W \leq 95$ wherein W (wt%) is a content of the inorganic filler (C) in the cured article, and the cured article forms a foamed layer during thermal decomposition or at ignition to exert flame retardancy.

2. The epoxy resin composition according to Claim 1 wherein an aromatic moiety and/or a polyaromatic moiety is included in a crosslinked structure of the cured article.

3. The epoxy resin composition according to Claim 2 wherein the aromatic moiety and/or the polyaromatic moiety selected from the group consisting of phenyl derivatives and biphenyl derivatives is included in the crosslinked structure of the cured article.

4. (amended) An epoxy resin composition comprising an epoxy resin (A), a phenolic resin (B), an inorganic filler (C) and a curing accelerator (D), wherein said composition does not comprise any flame retardant materials or flame retardant auxiliaries: a content of the inorganic filler (C) in a cured article obtained by curing the composition is represented by W (wt%), and values of Q₁ and Q₂ represented by the following

equations satisfy $Q_1 \geq 5$ and $5 \leq Q_2 \leq 50$, respectively,

$$Q_1 \text{ (wt\%)} = (q_1/q_3) \times 100$$

$$Q_2 \text{ (wt\%)} = \{(100 - q_1 - q_2)/q_3\} \times 100$$

wherein q_1 (wt%) is a weight ratio, to the cured article, of carbon monoxide
5 and carbon dioxide generated by placing a heat-resistant container including
the weighed cured article in a tubular furnace purged with an inert gas at
a constant flow rate to bring the atmosphere in the furnace into an inert
state, and then thermally decomposing the cured article at $700 \pm 10^\circ\text{C}$ for
10 minutes; q_2 (wt%) is a weight ratio, to the cured article, of a residue
at the completion of the thermal decomposition, i.e., the inorganic filler
and remains carbonized which are not thermally decomposed among the resin
components [components other than the inorganic filler (C)] in the cured
article; and q_3 (wt%) is a weight ratio of the resin components contained
15 in the cured article to the cured article, and the cured article forms a foamed
layer during thermal decomposition or at ignition to exert flame retardancy.

5. The epoxy resin composition according to Claim 4 wherein an
aromatic moiety and/or a polyaromatic moiety is included in a crosslinked
structure of the cured article.

6. The epoxy resin composition according to Claim 5 wherein the
20 aromatic moiety and/or the polyaromatic moiety selected from the group
consisting of phenyl derivatives and biphenyl derivatives is included in the
crosslinked structure of the cured article.

7. (amended) An epoxy resin composition comprising an epoxy
resin (A), a phenolic resin (B), an inorganic filler (C) and a curing
25 accelerator (D), wherein said composition does not comprise any flame

retardant materials or flame retardant auxiliaries: a flexural modulus E (kgf/mm²) at 240 ± 20°C of a cured article obtained by curing the composition is a value satisfying $0.015W + 4.1 \leq E \leq 0.27W + 21.8$ in the case of $30 \leq W < 60$, or a value satisfying $0.30W - 13 \leq E \leq 3.7W - 184$ in the case of $60 \leq W \leq 95$ wherein W (wt%) is a content of the inorganic filler (C) in the cured article; and values of Q₁ and Q₂ represented by the following equations satisfy $Q_1 \geq 5$ and $5 \leq Q_2 \leq 50$, respectively,

$$Q_1 \text{ (wt\%)} = (q_1/q_3) \times 100$$

$$Q_2 \text{ (wt\%)} = \{(100 - q_1 - q_2)/q_3\} \times 100$$

wherein q₁ (wt%) is a weight ratio, to the cured article, of carbon monoxide and carbon dioxide generated by placing a heat-resistant container including the weighed cured article in a tubular furnace purged with an inert gas at a constant flow rate to bring the atmosphere in the furnace into an inert state, and then thermally decomposing the cured article at 700 ± 10°C for 10 minutes; q₂ (wt%) is a weight ratio, to the cured article, of a residue at the completion of the thermal decomposition, i.e., the inorganic filler and remains carbonized which are not thermally decomposed among the resin components [components other than the inorganic filler (C)] in the cured article; and q₃ (wt%) is a weight ratio of the resin components contained in the cured article to the cured article, and the cured article forms a foamed layer during thermal decomposition or at ignition to exert flame retardancy.

8. The epoxy resin composition according to Claim 7 wherein an aromatic moiety and/or a polyaromatic moiety is included in a crosslinked structure of the cured article.

9. The epoxy resin composition according to Claim 8 wherein the

aromatic moiety and/or the polyaromatic moiety selected from the group consisting of phenyl derivatives and biphenyl derivatives is included in the crosslinked structure of the cured article.

10. (amended) An epoxy resin composition comprising an epoxy
5 resin (A), a phenolic resin (B), an inorganic filler (C) and a curing
accelerator (D), wherein said composition does not comprise any flame
retardant materials or flame retardant auxiliaries: a cured article obtained
by curing the composition forms a foamed layer during thermal decomposition
or at ignition to exert flame retardancy.

10 11. The epoxy resin composition according to Claim 10 wherein
an aromatic moiety and/or a polyaromatic moiety is included in a crosslinked
structure of the cured article.

12. The epoxy resin composition according to Claim 11 wherein
the aromatic moiety and/or the polyaromatic moiety selected from the group
15 consisting of phenyl derivatives and biphenyl derivatives is included in the
crosslinked structure of the cured article.

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13. A semiconductor device in which the epoxy resin composition
described in any one of Claims 1 to 12 is used as a encapsulating resin.